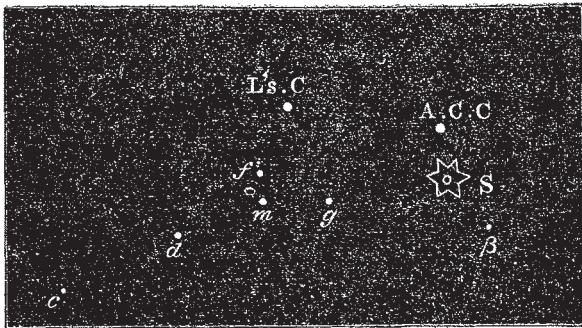


in 1869 it was seen on a bare sky. The further drawings by Mr. Ellery and Mr. Le Sueur are scarcely recognisable as being made from the same nebula, so vast appears the changes; in one instance the difference between two drawings shows a motion of the gas, if motion it be, of 6,000,000,000 miles a month. We have known comets' tails or jets to have a motion comparable to this—so perhaps some similar cause is acting here. Mr. L. Sueur appears to have carefully examined the spectrum of Jupiter with the Melbourne reflector, but with no very decisive results, the absorption-lines appearing constant across the slits, which leads him to infer that the light from the different parts of the visible surfaces had passed through not widely unequal thicknesses of atmosphere, or that the least thickness was sufficient to produce a maximum absorption. Mr. Ellery has been trying paper paraffined, instead of waxed, for photographing the continuous records of magnetic and other phenomena, thereby shortening the sensitising and developing by more than an hour; but he has found that by using plain paper some four hours are saved. The process he uses is a slight modification of Crooke's. A large number of enhydros or water-stones were found at Beechworth in 1864. On the granite rock near Beechworth



is a Silurian outlier of sandstone, intersected with veins of blue quartz, and in the widening of these veins the stones appear. They lie in nests lined with scales of chalcedony and fine clay. Mr. Dunn describes the enhydros as consisting of chalcedony, irregular in form, bounded by true planes varying in colour, from yellow and opaque to quite colourless and transparent, and their size from 5 in. diameter to the size of a split pea. The contents of the stones appear from analysis by Mr. Foord to consist of water slightly mineralised with chloride and sulphate of sodium, magnesium, calcium, and a soluble form of silicic acid. Mr. Macgeorge has been at work observing the small stars near Sirius. We copy his diagram of these stars, all of which require large optical means to render them visible: the position of Alvan Clarke's comet in January 1865 is given as $77^{\circ} 63'$, and that of Lassell's companion $163^{\circ} 89'$. We are glad to see papers on the colonial timber trees, discussing the suitability of certain trees to the climate. Amongst our English trees that thrive there, are the oak, elm, ash, walnut, willow; the larch, pines, and poplars, however, seem unsuited. The red and blue gums and the blackwood seem to be amongst the most useful indigenous trees. The poisoning of water and air in Melbourne has also been occupying the attention of the Society, and Mr. Gibbons furnishes the report with several well-executed micro-photographs of the water from sewage, and drinking water from the Yan-Zean reservoir, in which forms of life appear in abundance. Numerous other papers of interest appear in the report, and we must congratulate the Society on so good a show of research.

G. M. S.

NOTES

THE Anniversary Meeting of the Royal Society was held on Monday last; the list of the new Council we have already given. Owing to the absence of the President from domestic affliction, the chair was occupied by the Secretary, Mr. Spottiswoode. At the dinner in the evening three members of the Government were present—Lords Carnarvon and Salisbury, and Mr. W. Hunt. Lord Carnarvon in his speech gave out "no uncertain sound" as to what he deemed the duty of Government in the matter of endowment of scientific research; he virtually agreed to all the principles which we have so long and so strenuously advocated. We may therefore hope that the money to be devoted to the new Arctic Expedition is only a first instalment of what the Government think is due by the country to the promotion of directly unremunerative research.

THE command of the Arctic Expedition will be offered to one of those officers who acquired a thorough knowledge, in former expeditions, of sledge travelling, and of the true system of bringing men healthy and cheerful through an arctic winter. Thus it is intended that the present undertaking should start with the advantage of all the practical knowledge and all the experience which was accumulated in the searches for Franklin. It will also be composed of the pick of our educated young officers, and will so combine matured experience with dash and vigour. An important position will, we have no doubt, be offered to Commander A. H. Markham, whose qualifications for the post have already been well tested.

THE Oxford Professor of Geology, Mr. Prestwich, will deliver his inaugural lecture at the Museum on Friday, December 11, at 2 P.M.

THE Cambridge Board of Medical Studies have reported to the Vice-Chancellor that they have been engaged during the present term in revising the regulations for proceedings in medicine, and are desirous of recommending some changes. The Board are of opinion that it is expedient for the University to establish examinations and grant certificates of competency in so much of state medicine as is comprised in the functions of the officers of health. The certificate given to successful candidates should testify only to their competent knowledge of what is required for the duties of an officer of health. The Board recommend the following for the subjects of examination:—
 1. Physics and Chemistry. The principles of chemistry and methods of analysis, with especial reference to analyses (microscopical as well as chemical) of air and water; the Laws of Heat, and the principles of Pneumatics, Hydrostatics, and Hydraulics, with special reference to ventilation, water supply, drainage, construction of dwellings, and sanitary engineering in general.
 2. Laws relating to Public Health. 3. Sanitary Statistics.
 4. Origin, Propagation, Pathology, and Prevention of Epidemic and Infectious Diseases; effects of overcrowding, vitiated air, impure water, and bad or insufficient food; unhealthy occupations, and the diseases to which they give rise; water supply, and disposal of sewage and refuse; nuisances injurious to health; distribution of diseases within the United Kingdom, and effects of soil, season, and climate. The Vice-Chancellor has convened a meeting of general members of the Senate for to-day, in the Arts School, for the discussion of the report.

IT will be proposed in a Convocation to be held at Oxford on the 9th of December, that a sum not exceeding 100*l.* be placed at the disposal of Dr. Rolleston, Prof. H. J. S. Smith, and the Rev. Hereford B. George, M.A., of New College, for the purpose of purchasing archaeological objects relating to Prehistoric periods, to be placed in the University Museum.

THE following telegram is dated Aden, Nov. 28:—"Letters have been received from Lieut. Cameron to the 16th of May.

His party were all well. He had circumnavigated the Tanganyika Lake, and found the effluent south of Speke's Islands, which the natives reported to be Congo, identical with Livingstone's Lualaba. He hopes to reach Jellala Falls and Loanda."

SOUTH Australian papers record with the utmost satisfaction the success of Mr. John Forrest in crossing from the western coast of Australia to the Overland Telegraph, through the very heart of the only extensive region in Australia which remains unexplored. He and his companions travelled nearly 2,000 miles, keeping close to the 26th parallel of south latitude. They left Champion Bay on April 1, and reached the telegraph line on Sept. 27. Much of the territory passed over was of the poorest possible description, and for 600 miles the travellers had to force their way through a spinifex desert scantily supplied with water. They had several times to fight the natives. Mr. Forrest has narrowed down, within very moderate limits, the unexplored territory lying between the settled districts of South and Western Australia. His achievement leaves only the direct and more southern route to Perth to be traversed in order to complete the data requisite for giving to the world a fair general insight into the character of the West Australian Continent.

THE American Academy of Sciences held its half-yearly session at Philadelphia on Nov. 3, 4, and 5 last, when a number of valuable papers were read. We have only space for the titles of the more important:—"Results derived from an examination of the U.S. Weather Maps for 1872-3," by Prof. E. Loomis; "The Composite Nature of the Electric Discharge," by Prof. A. M. Mayer; "The Decay of Crystalline Rocks," by Prof. T. Sterry Hunt; "Geological Survey of Colorado," by Dr. F. V. Hayden. Dr. Hayden exhibited photographs of ruined cities and villages discovered by his party in the cañons leading into the Colorado River and upon the plains in the vicinity, supposed to have been built more than 1,000 years ago by the ancestors of the present Moquis Indians. The important fact established by these discoveries is, that there once existed in what are now the arid plains and savage gorges of South-eastern Colorado a race so far civilised that they built large cities, constructing their houses of well-hewn blocks of stone, with timber floors, well-formed windows and doorways, and smoothly plastered walls, and that they possessed the art of making glazed pottery.—"Nervous System of Limulus," by Mr. A. S. Packard, jun.; "Measuring Minute Changes in Atmospheric Pressure," by Prof. A. M. Mayer; "Effect of Wind on Sound Waves," by Prof. Joseph Henry; "Removal of Ammonia from Illuminating Gas," by Prof. B. Silliman; "Physical Measurement of the Horizontal Pendulum," and "Effect of Magnetism on Iron," by Prof. O. N. Rood; "Palaeontological Evidence of the Ages of Strata," by Prof. Theodore Gill.

If adulteration in England has become one of the arts, it is certain that we are not looked down upon by all nations as being beyond compare in this nefarious practice. A large trade has hitherto existed between Aleppo and England in extract of scammony; but we are told that comparatively little is now exported. "On account of its mixture with other substances," only twenty cases in all, weighing 2,100 lbs., were shipped during the past year, the value of which was 1,680*l.*, and the whole of this came to England. In the previous year, 737 cases were exported, showing that adulteration alone is rapidly driving this article out of the import market, for the roots are produced as abundantly as ever, and are dug up and sent to England, the extract being procured from them in this country. 467 cases, weighing 93,340 lbs., and valued at 362*l.*, were shipped from Aleppo to England in 1873. Considering the bulk and weight of the roots as compared with that of the extract and the consequent increase of the cost of freight, it would seem that this exportation of the roots themselves can scarcely be a profitable trade to the

shippers, inasmuch as 467 cases are valued only at 362*l.*, while twenty cases of the extract are worth 1,680*l.*

WE learn from a report on the trade and commerce of Maine U.S., that the quantity of lobster packed in cans in the factories of the coast in 1873 was 1,600,000 lb., mostly in 1 lb. cans. In addition to these, the same firms packed at their establishments in Nova Scotia over 2,000,000 cans, making the total amount packed by Portland houses in the past year, 3,600,000 cans of lobster. Besides other products which are packed in tins in America, as well for home consumption as for exportation, green maize is one of the most important; 4,000,000 cans of this maize were packed in Maine during the past year. In California a large and increasing trade is carried on in curing or drying fruits, which at one time was done by exposure of the fruits to the air. This, however, has been superseded by the process of desiccating with a blast of hot air. By this means the fruits retain all their freshness of flavour.

THE scarcity of oysters, which is now attracting renewed public attention, is a question which intimately affects a large number of people. The point is quite as important to the public as that of the scarcity of salmon, which was taken up by the Legislature thirteen years ago. Whether, as two rival parties of theorists maintain, the failure is due to natural causes or to over-dredging, the result to the public is the same, and it will only be by some systematic investigation that the doubts will be set at rest. That unfavourable weather should be the sole cause of the scarcity of oysters, for a dozen successive years, is very hard to believe; and though it is only natural that weather should have some effect upon the produce of these bivalves, it is more probable that over-dredging is equally if not more to blame. In such a case some restrictions are necessary, and these restrictions can only be enforced by the action of Parliament.

A FEW weeks ago we alluded to the suggestion made by the Government of Newfoundland for the establishment of a close time for seals. We are glad to see that our own Government are also alive to the necessity for some steps being taken to prevent the annual slaughter of thousands of young and immature and breeding seals which takes place at present. The first step will be to take the opinions of the owners of sealing vessels on the advisability of such a course, and with this object we understand that the officials of the Board of Trade have already arranged to visit the principal sealing ports of Scotland.

THE *Daily News* of Tuesday has a letter from its correspondent with the Egyptian Transit Expedition, dated Thebes, Nov. 9, from which we learn that the astronomers have located themselves on an island to the south of Karnak. So far everything has gone well, and if the weather only prove favourable the work is likely to be successful. To the east the horizon is unobstructed by anything except a distant range of hills, which cannot measure more than one angular degree.

A CORRESPONDENT, "H. B. P.," writes to correct Dr. Petermann's statement quoted in last week's article (p. 61) that the Ashantee War "cost nine millions sterling." "The utmost cost of the Ashantee expedition," our correspondent states, and he writes from the War Department, Woolwich, "was seventeen or eighteen hundred thousand pounds, and this includes stores innumerable, which were returned unshipped, and which have depreciated but little in value." This, however, in no way invalidates the force of Dr. Petermann's statement so far as concerns the purpose for which we adduced it.

MR. J. V. JONES, of University College, London, has been elected to the Brackenbury Natural Science Scholarship in connection with Balliol College, Oxford.

THE observations of the November swarm of falling stars at the several French stations had no result. It seems pretty certain that the phenomenon is now at its lowest ebb of brilliancy.

M. CHEVREUL, the director of the Paris Museum, has resigned his office owing to difficulties in the nomination of a professor. The administration and the professors have come to the conclusion that the appointment must be postponed for a year, and a *suppléant* will deliver the lectures.

THE first number of a new monthly illustrated periodical, largely devoted to science, has just appeared in Paris. It is entitled, *Revue Illustrée des Lettres, Sciences, Arts, et Industries dans les Deux Mondes*.

Annales Télégraphiques, a periodical issued by the French administration, but in abeyance for the last eight years, has again reappeared.

M. MARTIN, a French telegraphic engineer, has invented an engine for recording votes. The contrivance has been designed on the principle of the *sonnettes électriques*, and is exhibited in a shop in the Place Dauphine. The peculiarity is that the votes are registered and their total reckoned automatically. The invention is attracting public notice, as it is expected that the Versailles representatives will have an immense number of votes to register during the next session.

MR. ERNEST INGERSOLL, of Boston, U.S., who accompanied the party of Dr. Hayden during the past summer, as zoologist, has returned with a large quantity of specimens of natural history, which he is engaged in working up for publication. An important feature of this series consists in a very extensive collection of land and freshwater shells, a branch which has been too much neglected lately by explorers, to whom recent and fossil vertebrates have had greater attractions. Mr. Ingersoll was greatly surprised at the number and character of the molluscan forms secured in Colorado, as also their strange distribution and stations, and is confident that the facts which he has to present will be considered extremely interesting to conchologists.

AMONG the gaps that have remained unfilled in the series of reports of the Wilkes Expedition has been that on the plants collected by the party, partly in consequence of the failure of the U.S. Congress to make the necessary appropriations, and partly on account of the death of Dr. Torrey, who had charge of the phenogamous portion. This volume, however, has lately appeared, Dr. Gray having undertaken the work of Dr. Torrey after his death. That part relating to the cryptogamous plants (consisting of the mosses) had been already published in several portions—that on the mosses as prepared by Mr. W. S. Sullivan, that of the lichens by Prof. Tuckerman, and that on the algae by Professors Bailey and Harvey; the fungi by the late Dr. Curtis and Mr. Berkeley. The volume is an imperial quarto of 420 pages of letter-press, and contains twenty-nine plates. Of this only twenty copies are on sale, to be had of Westermann and Co., New York, and at the Herbarium of Harvard University.

THE Council of the Society of Arts have arranged with Prof. McLeod, of the India Engineering College, Cooper's Hill, to deliver two lectures (on dates to be hereafter determined) during the Christmas holidays. The subject will be "The Work and Food of the Iron Horse."

A SEVERE earthquake shock was felt in Chili shortly after midnight on Sept. 26. It extended as far north as Copiapo, and south as far as Talca, and was the heaviest shock experienced since the memorable one of July 7 last year. Valparaiso, Santiago, and intermediate country were almost on the focus of

the intensity of the shock. The earthquake travelled from east to west. The temperature immediately rose two degrees and six-tenths. The night was beautifully clear. Several slight tremors were felt during the ensuing week.

THE Hastings and St. Leonards Philosophical and Historical Society, which has entered on the seventeenth year of its work, is on the whole in a healthy condition. A number of the members have undertaken to investigate the science of the neighbourhood in connection with botany, zoology, archaeology, geology, meteorology, &c., so that we may expect by and by some results of substantial value.

IT is gratifying to hear that an attempt is being made to create an interest in science in North London. A series of lectures on scientific subjects are being given in the Athenaeum, Camden Road, at a very moderate price, and we hope the result will be the formation of a North London Scientific Society and Field Club, somewhat after the model of the one recently started in West London. These North London lectures we shall notify in our "Diary."

A RECENT number of the *Australian Sketcher* contains a very interesting account of the great Melbourne telescope, with which so much good work has already been done by Mr. Ellery and his staff; a series of well-executed illustrations accompany the paper. It is, as the article justly concludes, to the credit of the colony that amidst its prevalent utilitarianism it remembered and recognised the claims of science to the degree implied in the purchase and support of so noble an instrument. The telescope cost about 5,000*l.*, in addition to the sum of 1,500*l.* for the house.

WE are glad to see that Mr. W. G. Valentin's "Course of Qualitative Chemical Analysis" (Churchill) has reached a third edition.

DR. WEINHOLD's excellent "Vorschule der Experimentalphysik," which we noticed in vol. iv. p. 158, has reached a second edition, in which the author has brought his work up to time.

"BEAUTY in Common Things" is the title of a very pretty quarto volume published by the Society for Promoting Christian Knowledge. It consists of twelve chromolithographed drawings from nature by Mrs. J. W. Whymper, with descriptive text by the author of "Life Underground." The drawings are all of the most common plants, such as the Bramble, the Wild Strawberry, Furze Blossom, Blackthorn, Mushrooms, &c.; but while perfectly faithful to nature, the arrangement and execution are so artistic as to afford genuine pleasure. The text is pleasant and informing, and altogether the book is a very beautiful Christmas present, and likely to give children into whose hands it may fall, a taste for the study of nature.

WE have received the fifth edition (dated 1875) of Dr. J. H. Bennett's very interesting book, "Winter and Spring on the Shores of the Mediterranean" (Churchill). We recommend it to those in search of a genial winter home.

FROM Liverpool comes a carefully compiled "Synopsis of an Arrangement of Invertebrate Animals in the Free Public Museum of Liverpool," by the Rev. H. H. Higgins, M.A. Prefixed is an introduction the substance of which appeared in two articles by Mr. Higgins, in NATURE, vol. iii. pp. 202 and 481.

THE Geological, Botanical, and Natural History Section of the Catalogue of the Leeds Public Library contains the names of many valuable works of reference. Some of our readers may be glad to know that access can be had at all times to any of the works mentioned in the catalogue.

The additions to the Zoological Society's Gardens during the past week include two Great Kangaroos (*Macropus giganteus*), from New South Wales, presented by Mr. A. Nicol; two Common Boas (*Boa constrictor*), two Agoutis (*Dasyprocta?*), from St. Lucia, presented by Mr. Neville Holland; a Virginian Deer (*Cervus virginianus*), from South America, presented by Capt. E. H. Cobbett; a Gazelle (*Gazella dorcas*), from Egypt, presented by Miss Lancaster; a Common Peafowl (*Pavo cristatus*), from India, presented by the Hon. A. S. G. Canning; a Vervet Monkey (*Cercopithecus lalandii*), from South Africa; and a Sun Badger (*Helictis meschata*), from East Asia, new to the collection.

THE "CHALLENGER" EXPEDITION*

DURING our southern cruise the sounding-lead brought up five absolutely distinct kinds of sea-bottom, without taking into account the rock and detritus of shallow soundings in the neighbourhood of land. Our first two soundings in 98 and 150 fathoms on the 17th and 18th of December were in the region of the Agulhas current. These soundings would have been naturally logged "greenish sand," but on examining the sandy particles with the microscope, they were found to consist almost without exception of the casts of foraminifera in one of the complex silicates of alumina, iron, and potash, probably some form of glauconite. The genera principally represented by these casts were *Miliola*, *Bioculina*, *Uvigerina*, *Planorbolina*, *Rotalia*, *Textularia*, *Bulimina*, and *Nunnulina*; *Globigerina*, *Orbulina*, and *Palvinulina* were present, but not nearly in so great abundance. There were very few foraminifera on the surface of the sea at the time. This kind of bottom has been met with once or twice before; but it is evidently exceptional, depending upon some peculiar local conditions.

From the Cape, as far south as our station in lat. $46^{\circ} 16'$, we found no depth greater than 1,900 fathoms, and the bottom was in every case "Globigerina ooze;" that is to say, it consisted of little else than the shells of *Globigerina*, whole, or more or less broken up, with a small proportion of the shells of *Palvinulina* and of *Orbulina*, and the spines and tests of radiolarians and fragments of the spicules of sponges.

Mr. Murray has been paying the closest attention since the time of our departure to the question of the origin of this calcareous formation, which is of so great interest and importance on account of its anomalous character and its enormous extension. Very early in the voyage he formed the opinion that all the organisms entering into its composition at the bottom are dead, and that all of them live abundantly at the surface and at intermediate depths over the *Globigerina*-ooze area, the ooze being formed by the subsiding of these shells to the bottom after death.

This is by no means a new view. It was advocated by the late Prof. Bailey, of West Point, shortly after the discovery, by means of Lieut. Broke's ingenious sounding instrument, that such a formation had a wide extension in the Atlantic. Johannes Müller, Count Pourtales, Krohn, and Max-Schultze, observed *Globigerina* and *Orbulina* living on the surface; and Ernst Haeckel, in his important work upon the Radiolaria, remarks that "we often find upon, and carried along by the floating pieces of seaweed which are so frequently met with in all seas, foraminifera as well as other animal forms which habitually live at the bottom." However, setting aside these accidental instances, certain foraminifera, particularly in their younger stages, occur in some localities so constantly and in such numbers, floating on the surface of the sea, that the suspicion seems justifiable that they possess, at all events at a certain period of their existence, a pelagic mode of life, differing in this respect from most of the remainder of their class. Thus Müller often found in the contents of the surface net off the coast of France the young of *Rotalia*, but more particularly *Globigerina* and *Orbulina*, the two latter frequently covered with fine calcareous tubes, prolongations of the borders of the fine pores through which the pseudopodia protrude through the shell. I took similar *Globigerina* and *Orbulina* almost daily in a fine net at Messina, often

* "Preliminary Notes on the Nature of the Sea-bottom procured by the Soundings of H.M.S. *Challenger* during her Cruise in the Southern Sea in the early part of the year 1874." By Prof. C. Wyville Thomson, F.R.S., director of the Civilian Scientific Staff on board. Read before the Royal Society, Nov. 26, 1874.

in great numbers, particularly in February. Often the shell was covered with a whole forest of extremely long and delicate calcareous tubes projecting from all sides, and probably contributing essentially to enable these little animals to float below the surface of the water by increasing their surface greatly, and consequently their friction against the water, and rendering it more difficult for them to sink."* In 1865 and 1866 two papers were read by Major Owen, F.L.S., before the Linnean Society, "On the Surface Fauna of Mid-Ocean." In these communications the author stated that he had taken foraminifera of the genera *Globigerina* and *Palvinulina*, living in the tow-net on the surface, at many stations in the Indian and Atlantic Oceans. He described the special forms of these genera which were most common, and gave an interesting account of their habits, proposing for a family which should include *Globigerina*, with *Orbulina* as a sub-genus, and *Palvinulina*, the name *Colymbita*, from the circumstance that, like the Radiolaria, these foraminifera are found on the surface after sunset, "diving" to some depth beneath it during the heat of the day. Our colleague, Mr. Gwyn Jeffreys, chiefly on the strength of Major Owen's papers, maintained that certain foraminifera were surface animals, in opposition to Dr. Carpenter and myself.† I had formed and expressed a very strong opinion on the matter. It seemed to me that the evidence was conclusive that the foraminifera which formed the *Globigerina* ooze lived on the bottom, and that the occurrence of individuals on the surface was accidental and exceptional; but after going into the thing carefully, and considering the mass of evidence which has been accumulated by Mr. Murray, I now admit that I was in error; and I agree with him that it may be taken as proved that all the materials of such deposits, with the exception, of course, of the remains of animals which we now know to live at the bottom at all depths, which occur in the deposit as foreign bodies, are derived from the surface.

Mr. Murray has combined with a careful examination of the soundings a constant use of the tow-net, usually at the surface, but also at depths of from ten to one hundred fathoms; and he finds the closest relation to exist between the surface fauna of any particular locality and the deposit which is taking place at the bottom. In all seas, from the equator to the polar ice, the tow-net contains *Globigerina*. They are more abundant and of a larger size in warmer seas; several varieties, attaining a large size and presenting marked varietal characters, are found in the intertropical area of the Atlantic. In the latitude of Kerguelen they are less numerous and smaller, while further south they are still more dwarfed, and only one variety, the typical *Globigerina bulliformis*, is represented. The living *Globigerina* from the tow-net are singularly different in appearance from the dead shells we find at the bottom. The shell is clear and transparent, and each of the pores which penetrate it is surrounded by a raised crest, the crest round adjacent pores coalescing into a roughly hexagonal network, so that the pores appear to lie at the bottom of a hexagonal pit. At each angle of this hexagon the crest gives off a delicate flexible calcareous spine, which is sometimes four or five times the diameter of the shell in length. The spines radiate symmetrically from the direction of the centre of each chamber of the shell, and the sheaves of long transparent needles crossing one another in different directions have a very beautiful effect. The smaller inner chambers of the shell are entirely filled with an orange-yellow granular sarcod; and the large terminal chamber usually contains only a small irregular mass, or two or three small masses run together, of the same yellow sarcod stuck against one side, the remainder of the chamber being empty. No definite arrangement and no approach to structure was observed in the sarcod, and no differentiation, with the exception of round bright-yellow oil-globules, very much like those found in some of the radiolarians, which are scattered apparently irregularly in the sarcod. We never have been able to detect in any of the large number of *Globigerinae* which we have examined the least trace of pseudopodia, or any extension in any form of the sarcod beyond the shell.

Major Owen (*op. cit.*) has referred the *Globigerina* with spines to a distinct species, under the name of *G. hirsuta*. I am inclined rather to believe that all *Globigerinae* are to a greater or

* "Die Radiolarien." Eine Monographie von Dr. Ernst Haeckel. Berlin, 1862, pp. 165, 167.

† Mr. Jeffreys desires to record his dissent from this conclusion, since from his own observations, as well as those of Major Owen and Lieut. Palmer, he believes *Globigerina* to be exclusively an oceanic foraminifera inhabiting only the superficial stratum of the sea. (Preliminary Report of the Scientific Exploration of the Deep Sea, "Proceedings of the Royal Society," No. 121, page 443.)